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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/873,264	06/05/2001	Toru Uchida	010726	6047

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EXAMINER

BAUMEISTER, BRADLEY W

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 06/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/873,264

Applicant(s)

UCHIDA ET AL.

Examiner

B. William Baumeister

Art Unit

2815

Am

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 5, 7, 9, 11 and 13-20 is/are pending in the application.
- 4a) Of the above claim(s) 16 and 17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-3, 5, 7, 9, 11, 13-15 and 18-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:
 - a. Page 4, lines 24-32: This portion of the specification discusses prior-art depicted in Fig 2. The specification discusses strained InGaP compositions, while Fig 2 sets forth that the compositions are InGaAs.
 - b. Page 11, line 33, equation (2): the examiner did not find a definition for the coefficient, "A," used in the equation.
 - c. In Applicant's amendment A, filed 2/24/2003, Applicant amended the specification's paragraph starting at page 11, line 5. The amendment inadvertently omitted the originally-presented symbol "O" in the next to last line of the paragraph.

Appropriate correction to these and any other minor discrepancies of which Applicant becomes aware is required.

Claim Rejections - 35 USC § 102 and § 103

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in-

- (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
- (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3, 5, 7, 9, 11, 13-15 and 18-20 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Svilans '200.

a. Svilans discloses photodetectors with an active layer having alternating compressive-strained and tensile strained InGaAs layers arranged so that the total effective strain of the active region is balanced and capable of operating in a wide wavelength range, covering a wide range of temperatures (e.g., ABSTRACT). The wavelength range includes 1620 nm (col. 3, lines 5-11) and operating temperatures including -40 C (e.g., col. 3, lines 39-42 and col. 8, lines 43-46).

Note, for example, the embodiment of FIGs 1 and 2 wherein the active layer 16 comprises 15 cycles (col 4, lines 45-) of 80-nm, 0.25%-compressive-strained In_{0.57}Ga_{0.43}As layers and 20 nm, 1.03%-tensile-strained In_{0.385}Ga_{0.615}As layers formed on an n-doped InP substrate 12 (col. 4, line 44). The strains and thicknesses satisfy the equation now incorporated into claim 1 from canceled claim 4. Further, Applicant's Fig. 6 and associated discussion at page 14 of the present application evidence that this embodiment of Svilans will inherently achieve an optical absorption efficiency of at least

50% (about 53%) when an optical radiation having a wavelength of 1620 nm comes in at a temperature of -40C.

b. Regarding claims 11 and 13-15, FIGs 7a-c depict the associated discussion set forth at col. 8 relating to the optional use of step-grading or continuous grading layers between the first and second layers.

c. Applicant has previously amended claim 1 to recite that the first semiconductor layer has a strain magnitude *exceeding* 0.25%, in order to distinguish over Svilans' specific example of 0.25%, itself. Similarly, previously added claim 18 recites that the thickness of the first and second layers is *less than* 1.5 um, to distinguish over Svilans' specific example of 1.5 um; and claims 19 and 20 respectively recite that the thickness of the first layer is *less than* or *greater than* 80 nm, as opposed to being equal to 80 nm, itself. Restated, Applicant's claims respectively set forth strain and thickness ranges that have endpoints which are intended to approach very closely, but expressly exclude, the specific strain and thickness values set forth in the Svilans example. Since the legal precedence is unclear as to whether, under this fact pattern, Svilans constitutes a 102 anticipation of the claims or alternatively renders the claim obvious under 35 USC 103 (see e.g. *Ex Parte Lee*, 31 USPQ2d 1105 (BdPatApp&Int, 1993), the rejection is set out in the alternative for the reasons appearing below:

i. The claims are rejected as anticipated under the theory that because the open-ended endpoints of claimed ranges may approach infinitely close to the strain and thickness values of Svilans, the claims effectively still recite a structure

that reads on the example of Svilans--or at least within any chosen minimal design tolerance thereof.

ii. The claims are alternatively rejected as obvious under the theory that even if not constituting an overlapping range, the claims' ranges are close enough to the values taught by Svilans that one skilled in the art would have expected them to have the same properties. *See, In re Peterson*, 65 USPQ2d 1379, 1382 (CAFC 2003), *citing Titanium Metals Corp. V. Banner*, 227 USPQ 773, 779 (Fed. Cir, 1985). This closeness and expectation of same properties is evidenced, for example, by the fact that claims 19 and 20 approach Svilans' recited 80-nm thickness from both below and above, respectively.

Response to Arguments

5.. Applicant's arguments filed 3/17/2004 have been fully considered but they are not persuasive.

a. Applicant argues that the limitation—the strain exceeding 0.25%—does not overlap the 0.25% strain recited in Svilans' example. The examiner previously acknowledged this fact. The basis for the anticipation rejection—that the claims allow for strains within any design tolerances chosen for Svilans' 0.25% strain—was explained previously.

b. Applicant argues that present invention is based upon the discovery of a new theory. However, this theory still produces a structure anticipated by Svilans. Applicant is reminded that it is well-settled law that the discovery of the theory by which a prior-art device operates is not patentable. Rather, while a device which incorporates a novel

theory may be patentable, such a device must still be novel and unobvious from prior-art devices. Also, the discovery of a new property or use of a previously known composition, even when that property and use are unobvious from the prior art, can not impart patentability to claims to the known composition. *In re Spada* (CAFC) 15 USPQ2d 1655, 1657 (1990) (internal citations omitted).

- i. Applicant has attempted to overcome the anticipation rejection by limiting the claims to recite strains that are greater than 0.25%, so as to exclude the 0.25% strain taught by Svilans. Applicant has not explained why any ever-so-slight deviation from Svilans' 0.25% strain example would not constitute an obvious modification obtainable by the skilled artisan through routine experimentation.
- c. Applicant argues that Svilans thickness is controlled to be below the well known critical thickness used in a strained layered system and therefore there is formation of misfit dislocations. This argument is not technically sound. The well-known purpose of using strained layers is to **prevent** the formation of misfit locations which would otherwise arise if the lattice-mismatched materials were grown beyond the critical thickness so as to be relaxed.
- d. Applicant notes that the independent claims now further recite the absorption efficiency of 50% or more for a 1620 nm wavelength at -40 C. The rejection explains that Svilans structure would inherently satisfy this limitation.
- e. Applicant argues that Svilans' goals are entirely different because Svilans endeavors to maximize optical absorption over a range of wavelengths whereas the present invention maximizes optical absorption for a predetermined wavelength.

However, this difference does not make Svilans' goals "entirely different" than Applicants.' Svilans and Applicant's inventions are both directed towards optimizing optical absorption in a photodetector that may be used at temperatures around -40 C. Moreover, the wavelength range which Svilans wishes to optimize includes Applicant's predetermined wavelength of 1620 nm.

Furthermore, the fact that applicant may have recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

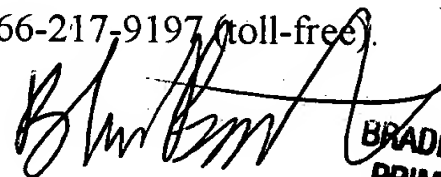
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to B. William Baumeister whose telephone number is (571) 272-1722. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


BRADLEY BAUMEISTER
PRIMARY EXAMINER
B. William Baumeister
Primary Examiner
Art Unit 2815

May 30, 2004